

REMARKS

This Amendment is filed in response to the Final Office Action dated Sept. 19, 2006. The Applicant respectfully requests reconsideration of the rejections contained therein. All objections and rejections are respectfully traversed.

Claims 1-35 are pending in the case.

Claims 1 and 23-24 have been amended. The Applicant respectfully that entry of these claim amendments is appropriate after Final Rejection, as it should not necessitate substantial new consideration by the Examiner. Claims 1 and 23 are amended in accord with the Examiner's suggestions, while claim 24 is simply amended to correct a minor typographical error (a misplaced colon).

No claims have been added.

Claim Rejections - 35 U.S.C. §112

At paragraphs 2 and 3 of the Final Office Action, claims 1-16 and 23-25 were rejected under 35 U.S.C. §112, second paragraph. The Applicant now amends the claims as suggested by the Examiner, and accordingly this rejection is now believed to be moot.

Interpretation of the Modi Reference

The Applicant respectfully urges that the Final Office Action misinterprets Modi et al., U.S. patent No. 6,587,866, and attributed meaning to the reference far beyond what is taught and suggested therein. To properly establish a prima facie case of obviousness, references must teach or suggest every aspect of the claims. Indeed, MPEP §2142 emphasizes this point stating in relevant part:

To establish a prima facie case of obviousness, three basic criteria must be met... [the third criteria being] the prior art reference (or references when combined) *must teach or suggest all the claim limitations*

Modi has been relied upon in the Final Office Action as allegedly teaching or suggesting many of the Applicant's claim elements. Yet, when the cited sections of Modi are carefully examined, it is clear they bear little relation to the Applicant's claims, and certainly do not rise to the level of teaching or suggesting the claims as required by MPEP §2142.

For example, looking to the dependent claims where this is most apparent, dependent claim 2 reads:

2. The method of claim 1 wherein the step of determining a cost further comprises the step of:
calculating the cost using a rate associated with processing the packet.

The basis for the rejection of claim 2 is stated to be Modi col. 1, at lines 38-39, which reads:

The present invention relates to clustered computer system with multiple nodes that provides services in a scalable manner.

Modi lines 38-39 has little to do with calculating anything, much less calculating a first specific quantity, "cost," using a second specific quantity, "rate associated with processing the packet." Instead, Modi, at lines 38-39, simply discusses the desire that a computer system be expandable (scalable).

Further, dependent claims 4 and 5 read:

4. The method of claim 2 wherein the step of calculating the cost further comprising the step of:
dividing the packet's size by the rate.

5. The method of claim 2 wherein the step of calculating the cost further comprises the step of:
multiplying the packet's size by a multiplicative inverse of the rate.

The basis for the rejection of claims 4 and 5 is stated to be Modi col. 15 at lines 39-41, which read:

When the user sends data, a connection is established, the data is divided into packets, which are sent to the server during the connection.

Clearly, Modi does is not discuss calculations of dividing and multiplying, much less dividing or multiplying a first specific quantity, "packet's size," by a second specific quantity, "the rate" or "multiplicative inverse of the rate," as part of "calculating the cost." Instead, Modi col. 15 at lines 39-41 deals with physically segmenting (i.e. packetizing) data; breaking a large chunk of data into several smaller chunks of data.

Also, dependent claim 7 reads:

7. The method of claim 1 wherein the step of determining an anticipated load further comprises the step of:
adding the cost to a cumulative load associated with each coprocessor in the plurality of coprocessors.

The basis for the rejection of claim 7 is stated to be Modi at col. 1, lines 60-65, which read:

It is desirable for such a system to be efficient in order to accommodate as much traffic as possible with a minimal amount of response time. It is desirable for a system to be "scalable," so that additional server nodes can be added and balancing between the nodes can be modifiable to provide a serve as demand for the system increase.

Again, there is no teaching or suggestion in Modi of adding a first specific quantity, "the cost," to a second specific quantity, "a cumulative load associated with each coprocessor

in the plurality of coprocessors,” as part of a step of “determining an anticipated load,” yet another specific quantity. Modi col. 1 at lines 60-65 simply discusses the general goal that a system be “efficient” and “scalable.”

Accordingly, in light of these three examples, the Applicant respectfully requests reconsideration of the interpretation of Modi and the use of Modi in rejecting the Applicant’s claims.

Claim Rejections - 35 U.S.C. §102

At paragraphs 4-5 of the Final Office Action, claims 1-25 were rejected under 35 U.S.C. 102(e) as being anticipated by Modi et al., U. S. Patent No. 6,587,866, in view of Walker et al., U.S. Patent No. 5,613,069.

The Applicant’s claim 1, representative in part of the other rejected claims, sets forth:

1. A method for selecting a coprocessor from a plurality of coprocessors to process a packet, the method comprising the steps of:
 - determining a size of the packet;
 - determining a cost associated with the packet in response to the size of the packet***, the cost representing a load associated with processing the packet;
 - determining an anticipated load for each coprocessor in the plurality of coprocessors using the cost***; and
 - selecting the coprocessor from the plurality of coprocessors based on the anticipated load.***

Modi discloses a load balancing scheme for distributing packets among a plurality of server nodes in a clustered processing system. *See* col. 3, lines 18-22 and col. 7, lines 61-64. The scheme uses one of a plurality of policy types, included “non-affinity” policy types where packets are distributed to any server node, and “affinity” policy types where packets from a single client are sent to the same server node. *See* col. 7, lines 61 to col. 8, lines 2 and col. 2, lines 42-47. The “non-affinity” policy types include the well-known “round robin” and “weighted round robin” techniques. In a weighted round robin

technique, nodes are assigned differing weights to account for differing processing capabilities, and accordingly the probability of a particular packet being sent to a particular node is dependent on that node's relative weight. Modi does this by giving some nodes more entries in a packet distribution table (PDT) 304 than others. Specifically, "a high performance sever node is given more entities in PDT 204 than a slower server node that is able to able process less traffic. In this way, the high-performance server node will, on average, receive more traffic than the slower server node." *See* col. 8, lines 21-25 and col. 9, lines 46-52. **Thereafter, the IP address of a received packet is hashed over the packet distribution table (PDT)** and in response to the hash the packet placed in a "bucket" associated with a particular node. *See* col. 10, lines 32-33 and col. 14, lines 59-67 (emphasis added).

Walker discloses a packet switching network in which an "average transmission delay" is computed using formulas that include "average packet size," abbreviated b_{av} . *See* abstract and col. 18, lines 7-67.

The Applicant respectfully urges that both Modi and Walker are silent concerning the Applicant's claimed "***determining a cost associated with the packet in response to the size of the packet, the cost representing a load associated with processing the packet***" and "***determining an anticipated load for each coprocessor in the plurality of coprocessors using the cost***" and "***selecting the coprocessor from the plurality of coprocessors based on the anticipated load.***"

The Applicant uses the ***size of the packet*** according to a claimed technique to determine which coprocessor will process the packet. As the Applicant describes in the Background section of the Application, prior techniques have suffered shortcomings since they simply balance **the numbers** of packets received by coprocessors, and generally do not take into consideration the amount of resources that may be required to process any particular packet. For example, as described at page 3, lines 22-29 of the Specification, three 100-byte packets may be processed more rapidly than two 1400-byte packets, yet many prior techniques have largely ignored this, instead merely count numbers of

packets. Thus, with many prior techniques, a coprocessor processing three 100-byte packets would be incorrectly considered more burdened than the one processing two 1400-byte packets.

The techniques discussed in Modi, suffer the very shortcomings discussed by the Applicant in the background section of the Application. Modi does not consider packet size in determining which node (coprocessor) should process a packet. Instead, Modi simply balances **the number of packets to be processed**, by hashing the **IP address of packets** over a packet distribution table. *See* col. 10, lines 32-33 and col. 14, lines 59-67. A fast node in Modi may get more (a greater number of) packets to process, while a slow node may only get a few packets to process. However, as described in the Applicant's background section this may not be an optimal result as the faster node may receive many small packets that may be processed rapidly and the slower node may receive many large packets that require more lengthy processing.

Combination with Walker does not remedy the deficiencies of Modi. First, there is no motivation to combine the references. Walker simply mentions "average packet size," in a discussion of how to calculate "average transmission delay." To combine Walker with Modi, one would have to expressly ignore the teachings of Modi that one should balance **the number of packets to be processed**, by hashing the **IP address** over a packet distribution table. Then, one would have to somehow substitute in a mere mention of "average packet size" from the entirely different context it appears in Walker. There is simply no motivation to do this.

Second, even if one were to somehow combine the references, it would still not teach or suggest the Applicant's claims. Modi functions in a very different manner than what is claimed by the Applicant. Thus, even if one were to somehow adapt Modi to look to packet size, the Applicant's specific claimed technique would not be suggested. The applicant claims *determining a cost associated with the packet in response to the size of the packet* and in *"determining an anticipated load for each coprocessor in the plurality of coprocessors using the cost"* and then *"selecting the coprocessor from the*

plurality of coprocessors based on the anticipated load.” None of this is touched upon by either reference.

Accordingly, the Applicant respectfully urges that Modi and Walker are legally insufficient to make obvious the present claims under 35 U.S.C. §103 because of the absence of the Applicant’s claimed novel “*determining a cost associated with the packet in response to the size of the packet, the cost representing a load associated with processing the packet*” and “*determining an anticipated load for each coprocessor in the plurality of coprocessors using the cost*” and “*selecting the coprocessor from the plurality of coprocessors based on the anticipated load.*”

In the event that the Examiner deems personal contact desirable in disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-2500.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



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